Name _____ Class _____ Date _____

Additional Practice

Lessons 7.6 and 7.7

1. **a.** Find two polynomials with the same degree that have a sum of $x^2 + 5x - 3$.
b. Find two polynomials with different degrees that have a sum of $x^2 + 5x - 3$.
c. Find two polynomials that have a sum of -10.
d. Find two polynomials that have a product of $x^2 - 16$.

2. Use $h(x) = x^2 - 3x + 8$.
a. Find a polynomial $k(x)$ such that $h(x) + k(x) = 3x^2 + 5x + 10$.
b. Find a polynomial $m(x)$ such that $h(x) + m(x) = 2x^2 - 3$.
c. Find a polynomial $n(x)$ such that $h(x) + n(x)$ has degree 2 and $h(x)n(x)$ has degree 3.

3. Find the value of d such that $(x + d)(x + 5) = x^2 + 8x + 15$ is an identity.

4. Expand and combine like terms.
a. $(x - 1)^2 - x^2$
b. $(x - 1)^3 - x^3$
c. $(x - 1)^4 - x^4$
d. $(x - y)^2 - y^2$
e. $(x - y)^3 - y^3$
f. $(x - y)^4 - y^4$
g. $x(x + 1) - x$
h. $x(x - 1)(x - 2) + x(x - 1)(3)$
i. $x(x - 1)(x - 2) + x(x - 2)(3)$

5. Transform the expression below into normal form. For what values of b is the coefficient of x equal to zero?

$$(x^2 + 2x + b)(x^2 + 2x - 5)$$

6. Prove that each identity is true. Use basic and derived rules.
a. $x^{10} - 4 = (x^5 + 2)(x^5 - 2)$
b. $x^3 + 1 = (x + 1)(x^2 - x + 1)$
c. $(a + 2b)^2 - (a - 2b)^2 = 8ab$
d. $(n + 1)^3 - n^2(n + 3) = 3n + 1$
e. $(x^2 + 2x)(x - 2) = (x^2 - 2x)(x + 2)$
f. $(x^2 + ax)(x - a) = (x^2 - ax)(x + a)$

7. Show that each equation is an identity.
a. $4a^2 - b^2 = 2a(2a - b) + b(2a - b)$
b. $(2a + 1)(2a - b) + (b - 1)(2a - b) = (2a + b)(2a - b)$

8. Find the normal form of each polynomial.
a. $(1 - x - x^2)(1 - x^3)$
b. $(1 - x - x^2 - x^3)(1 - x^4)$